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while with Canada field peas it was saccharose, glucose, maltose, lactose. Timothy was found to utilize lactose when grown in darkness, but not when grown in light. The influence of the sugars upon the rate of respiration in the vetch was observed, with the result that saccharose, glucose, and maltose accelerate respiration very noticeably, the latter somewhat less than the other two. Galactose was found to be toxic to wheat, peas, corn, and vetch, even at low concentrations; while glucose antagonizes the toxicity of galactose, possibly by rendering the roots impermeable to galactose, or by altering galactose metabolism in such a way as to prevent formation of toxic oxidation products. The author suggests as a general conclusion that soluble organic substances produced from humus during decay may play a more important rôle in the organic nutrition of plants than we have hitherto thought.—CHARLES A. SHULL.

Osmotic pressure in parasite and host.—Using the cryoscopic method, HARRIS and LAWRENCE²⁸ have studied the osmotic relations between 7 species of Jamaican mistletoes and their 19 hosts. They find that the sap concentration of the chlorophyllous tissues of the parasite is nearly always higher than that of the mature leaves of the host, the parasites showing an average concentration equivalent to 14.43 and the hosts to 13.59 atmospheres of osmotic pressure. This relationship is not a necessary one, however, for in several cases the parasites possessed sap of a lower concentration than their hosts. In such cases it is assumed that the host supplies more than sufficient water to meet its own needs, so that the parasite is not in direct competition with the leaves of the host, but merely secures water from the same transpiration stream. In cases of secondary parasitism, the osmotic pressure increases from host to primary and from primary to secondary parasite. The sap from the stems of leafless species of *Dendrophthora* possesses a lower concentration than that from leaves of species of *Phoradendron* and *Phthirusa*. The meaning of this is not discussed. It may involve differences in the rate of photosynthetic activity in the leafless and leafy forms.—CHARLES A. SHULL.

Galls.—ESSIC²⁹ calls attention to the introduction of the chrysanthemum gall fly from Europe. This pest was not known in the United States previous to 1915. It causes cone-shaped galls which often distort the shoot beyond recognition, and eventually causes death of the infected parts. It sometimes destroys one-third of the crop.

WELLS³⁰ gives us a very important study of the galls of the blackberry. The purpose of the paper is threefold: (1) a study of the histology of the galls;

²⁸ HARRIS, J. ARTHUR, and LAWRENCE, JOHN V., On the osmotic pressure of the tissue fluids of Jamaican Loranthaceae parasitic on various hosts. Amer. Jour. Bot. 3:438-455. 1916.

²⁹ ESSIC, E. O., The chrysanthemum gall fly, *Diarthronomyia hypogaea* F. Low. Jour. Econ. Ent. 9:461-468. 1916.

³⁰ WELLS, BERTRAM W., The comparative morphology of the zooecidia of *Celtis occidentalis*. Ohio Jour. Science 16:249-290. pls. 8. 1916.

(2) a study of the galls of *Celtis occidentalis*; (3) a comparative study of structures. The work is exceptionally well done and well presented. There are 17 known species of zoocecidia on the *C. occidentalis*. The acarinous and lepidopterous galls are kataplasma in character, and the hemipterous and dipterous galls protoplasma in character. This latter type is more closely comparable to the normal plant parts, but the tissue forms are new. The author very properly suggests that zoocecidology presents a unique field for the study of problems pertaining to the mechanism used in the expression of hereditary characters.—MEL. T. COOK.

Germination of rice.—NAGAI³¹ has made rather an extensive general study of the germination of rice, touching many points that have previously been worked out on other seeds. The cutinized inner integument of the ripe fruit is a semipermeable membrane. Such membranes have been found in the fruit walls of many grasses and in the coats of many seeds.³² Desiccated seeds of rice are not injured by steeping for 24 hours in ether, chloroform, absolute alcohol, acetone, and other substances. This is in accord with the work of BEQUEREL and of SHULL,³³ who have found that the dry coats of many seeds are impervious to such substances, but that, as the water content of the coats rises, they become more pervious. Rice germinates in an extremely low partial pressure of oxygen, yet the germination is abnormal, the hypocotyl growing only under considerable oxygen pressure. Acids and bases show no stimulative effects upon the germination of rice. A few hours of exposure to liquid air does not injure the seeds of rice or buckwheat. Two hours' exposure to 97-98° C. kills *Zea Mays*, but does little injury to rice, especially if it is desiccated.—WM. CROCKER.

Alkalies and salt absorption.—As a phase in the analysis of the effects of alkalies upon the development of plants, BREAZEALE³⁴ has studied the effect of NaCl, Na₂SO, and Na₂CO₃ upon the absorption of nitrates, phosphates, and potash by wheat seedlings. Up to 1000 ppm. in a nutrient solution they do not affect the absorption of nitrates. In this concentration NaCl does not modify phosphate absorption, but slightly depresses potash absorption. In 1000 ppm., Na₂SO₄ depresses the absorption of potash and phosphoric acid to approximately 70 per cent of that of the checks. In equal mol concentration Na₂CO₃ depresses the absorption of potash to 20 per cent and phosphoric acid to 30 per cent normal. With Na₂SO₃ these depressing effects were evident in 300 ppm. The writer thinks the depressing effect of the Na₂SO₄ is due to its

³¹ NAGAI, ISABURO, Some studies on the germination of seeds of *Oryza sativa*. Jour. Coll. Agric., Imperial University Tokyo 3:109-155. 1916.

³² BOT. GAZ. 56:160-199. 1913; 63:373-397. 1917.

³³ BOT. GAZ. 56:160-199. 1913.

³⁴ BREAZEALE, J. F., Effect of sodium salts in water cultures on the absorption of plant food by wheat seedlings. Jour. Agric. Research 7:407-416. 1916.